Psychopharmacologia

Editorial Board

D. Bovet, Sassari · J. O. Cole, Boston · J. Delay, Paris · J. Elkes, Baltimore
M. Hamilton, Leeds · H. Isbell, Lexington · E. Jacobsen, København
M. E. Jarvik, New York · S. S. Kety, Boston · C. Kornetsky, Boston · E. Rothlin, Basel
M. Shepherd, London · Hannah Steinberg, London · E. Strömgren, Risskov
A. Wikler, Lexington

Managing Editors

J. O. Cole · M. Hamilton · E. Jacobsen · C. Kornetsky

Advisory Board

Neurophysiologia

F. Bremer, Bruxelles
J. C. Eccles, Buffalo
A. Fessard, Paris
G. W. Harris, London
G. Moruzzi, Pisa
J. Z. Young, London

Neuropharmacologia

P. B. Bradley, Birmingham
A. Carlsson, Göteborg
H. Coper, Berlin
E. Domino, Ann Arbor
D. Efron, Chevy Chase
U. S. von Euler, Stockholm
W. S. Feldberg, London
S. Garattini, Milano
L. E. Hollister, Palo Alto
O. Hornykiewicz, Toronto
S. Irwin, Portland
K. F. Killam, Palo Alto
I. P. Lapin, Leningrad
L. Lasagna, Baltimore
E. Marley, London
W. R. Martin, Lexington
H. O. Schild, London
F. Sjöqvist, Stockholm
F. Sulser, Nashville
A. Weissman, Groton, Conn.
E. Zaimis, London

Neurochimia

S. Barondes, La Jolla
H. Blaschko, Oxford
J. Glowinski, Paris
D. Richter, Epsom
R. Rodnight, London
S. Udenfriend, Bethesda
H. Weil-Malherbe, Washington

Neurologia

H. Gastaut, Marseille
P. van Gehuchten, Bruxelles

Psychiatria

J. Angst, Zürich
H. Brill, New York
P. Deniker, Paris
P. Dick, Genève
F. Flügel, Erlangen
H. Hippius, Berlin
J. Jaffe, Chicago
G. Klerman, Boston
N. S. Kline, Orangeburg
M. H. Lader, London
A. J. Lewis, London
P. Pichot, Paris
K. Rickels, Philadelphia
J. Schildkraut, Boston

J. R. Smythies, Edinburgh
W. A. Stoll, Zürich
O. Vinar, Praha

Psychologia

P. Carlton, New Brunswick
P. B. Dews, Boston
A. DiMascio, Boston
H. J. Eysenck, London
S. Fisher, Boston
S. C. Goldberg, Chevy Chase
S. Grossman, Chicago
H. Hanson, West Point
H. E. Hill, Lexington
C. R. B. Joyce, Basel
M. Katz, Honolulu
R. Kelleher, Boston
V. Laties, Rochester
A. Latz, Boston
A. Lubin, Leeds
A. E. Maxwell, London
J. L. McGaugh, Irvine
A. Mirsky, Boston
D. Overton, Philadelphia
V. J. Polidora, Davis
R. Russell, Irvine
L. Stein, Philadelphia
A. Summerfield, London
T. Thompson, Minneapolis
O. Zangwill, Cambridge

Volume 18 · 1970

SPRINGER-VERLAG · BERLIN · HEIDELBERG · NEW YORK

With the acceptance of a manuscript for publication, the publishers acquire the sole copyright for all languages and countries, including all rights of photocopying or reproduction by any other method.

The use of registered names, trademarks etc. in this journal does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and, therefore, free for general use.

Springer-Verlag Berlin Heidelberg New York

Printed in Germany by Wiesbadener Graphische Betriebe GmbH, Wiesbaden
Copyright © by Springer-Verlag Berlin Heidelberg 1970

Contents

Page

Appel, J. B., Lovell, R. A., Freedman, D. X.: Alterations in the Behavioral Effects of LSD by Pretreatment with *p*-Chlorophenylalanine and α-Methyl-*p*-Tyrosine 387

Avivi, A., Chari-Bitron, A.: Estimation of Low Chlorpromazine Concentrations by Surfacing and Sinking Reaction of Minnows (*Gambusia affinis*) 407

Bättig, K.: The Effect of Pre- and Post-Trial Application of Nicotine on the 12 Problems of the Hebb-Williams-Test in the Rat 68

— Differential Effects of Nicotine and Tobacco Smoke Alkaloids on Swimming Endurance in the Rat 300

— see Driscoll, P. 305

Bainbridge, J. G.: The Inhibitory Effect of Amphetamine on Exploration in Mice 314

Baumel, I., DeFeo, J. J., Lal, H.: Alterations in Brain Sensitivity and Barbiturate Metabolism Unrelated to Aggression in Socially Deprived Mice 320

Bhagat, B.: Influence of Chronic Administration of Nicotine on the Turnover and Metabolism of Noradrenaline in the Rat Brain 325

Bieniek, D., see Carlini, E. A., et al. 82

Carlini, E. A., Santos, M., Claussen, U., Bieniek, D., Korte, F.: Structure Activity Relationship of Four Tetrahydrocannabinols and the Pharmacological Activity of Five Semi-Purified Extracts of *Cannabis sativa* . . . 82

Chari-Bitron, A., see Avivi, A. 407

Chisholm, D. C., Moore, J. W.: Effects of Chlordiazepoxide on Discriminative Fear Conditioning and Shuttle Avoidance Performance in the Rabbit . . . 162

Clark, M. L., Ramsey, H. R., Ragland, R. E., Rahhal, D. K., Serafetinides, E. A., Costiloe, J. P.: Chlorpromazine in Chronic Schizophrena: Behavioral Dose-Response Relationships 260

Claussen, U., see Carlini, E. A., et al. 82

Costiloe, J. P., see Clark, M. L., et al. 260

Crammer, J. L., Rolfe, B.: Metabolism of ^{14}C-Imipramine. III. Conversions by Rat Tissues 26

DeFoe, J. J., see Baumel, I., et al. 320

Delbarre, B., Dumas, G., Guionniere, M.: An Automated Open Field Method 227

Dési, I., Kertai, P., Farkas, I., Muskó, Zs., Hajós, P.: The Process of Learning in Rats Undergoing Prolonged Treatment with Psychotropic Agents 144

Dhawan, B. N., see Srimal, R. C. 99

Dhawan, K. N., Jaju, B. P., Gupta, G. P.: Validity of Antagonism of Different Effects of Reserpine as Test for Anti-Depressant Activity 94

Driscoll, P., Bättig, K.: The Effect of Nicotine and Total Alkaloids Extracted from Cigarette Smoke on Avoidance Behavior in Rats under Extinction Procedure 305

Dumas, G., see Delbarre, B., et al. 227

Farkas, I., see Dési, I., et al. 144

Page

Fekete, M., Kürti, M.: Psychopharmacologic Effects of some Cholinesterase Inhibitors in Comparison with Imipramine 238
Fog, R., Randrup, A., Pakkenberg, H.: Lesions in Corpus Striatum and Cortex of Rat Brains and the Effect on Pharmacologically Induced Stereotyped, Aggressive and Cataleptic Behaviour 346
Freedman, D. X., see Appel, J. B., et al. 387

Garg, M.: Combined Effect of Drug and Drive on the Consolidation Process . . 172
Gordon, P. E., see Hesbacher, P. T., et al. 180
Gray, B., see Hesbacher, P. T., et al. 180
Guionniere, M., see Delbarre, B., et al. 227
Gupta, G. P., see Dhawan, K. N., et al. 94

Haertzen, C. A.: Subjective Effects of Narcotic Antagonists Cyclazocine and Nalorphine on the Addiction Research Center Inventory (ARCI) 366
Hajós, P., see Dési, I., et al. 144
Heise, G. A., Lilie, N. L.: Effects of Scopolamine, Atropine, and d-Amphetamine on Internal and External Control of Responding on Non-Reinforced Trials 38
Hesbacher, P. T., Rickels, K., Gordon, P. E., Gray, B., Meckelnburg, R. Weise, C. C., Vandervort, W. J.: Setting, Patient, and Doctor Effects on Drug Response in Neurotic Patients. I. Differential Attrition, Dosage Deviation, and Side Reaction Responses to Treatment 180
— — Hutchison, J., Raab, E., Sablosky, L., Whalen, E. M., Phillips, F. J.: Setting, Patient, and Doctor Effects on Drug Response in Neurotic Patients. II. Differential Improvement 209
Hutchison, J., see Hesbacher, P. T., et al. 209

Jaju, B. P., see Dhawan, K. N., et al. 94
Janssen, P. A. J., see Niemegeers, C. J. E., et al. 249
Johnson, F. N.: The Effects of Chlorpromazine on One-Trial Passive Avoidance Learning in Mice: Further Examination of Pre- and Post-Learning Administration 11
— The Effects of Chlorpromazine on the Expression of an Acquired Passive Avoidance Response in Mice 333
Jones, B. J., Tolman, B. D., Roberts, D. J.: Studies on Interactions Involving Antidepressive and other Drugs with Tetrabenazine and Noradnamine on Locomotor Activity in Mice, Including Details of the Experimental Design and Statistical Analysis 288
Jones, R. T., Stone, G. C.: Psychological Studies of Marijuana and Alcohol in Man 108

Kapp, B. S., see Schneider, A. M., et al. 77
Keim, K. L., see Sigg, E. B. 378
Kertai, P., see Dési, I., et al. 144
König-Bersin, P., Waser, P. G., Langemann, H., Lichtensteiger, W.: Monoamines in the Brain under the Influence of Muscimol and Ibotenic Acid, Two Psychoactive Principles of Amanita Muscaria 1
Korf, J., Praag, H. M. van: The Intravenous Probenecid Test: a Possible Aid in Evaluation of the Serotonin Hypothesis on the Pathogenesis of Depressions 129
— see Praag, H. M. van, et al. 412
Korte, F., see Carlini, E. A., et al. 82
Kürti, M., see Fekete, M. 238
Kuzniecki, N., see Merlo, A. B. 124

Lader, M. H., Sakalis, G., Tansella, M.: Interactions between Sympathomimetic Amines and a New Monoamine Oxidase Inhibitor 118
Lal, H., see Baumel, I., et al. 320
Langemann, H., see König-Bersin, P., et al. 1
Lichtensteiger, W., see König-Bersin, P., et al. 1

Page

Lilie, N. L., see Heise, G. A. 38
Lovell, R. A., see Appel, J. B., et al. 387

Martin, W. R., Sloan, J. W.: Effects of Infused Tryptamine in Man 231
Meckelnburg, R., see Hesbacher, P. T., et al. 180
Merlo, A. B., Kuzniecki, N.: Effect of Imipramine and Chlorimipramine on an Acute Instrumental Trace Conditioned Reflex in Rats 124
Meyerson, B. J.: Monoamines and Hormone Activated Oestrous Behaviour in the Ovariectomized Hamster 50
Moore, J. W., see Chisholm, D. C. 162
Morrison, C. F., Stephenson, J. A.: Drug Effects on a Measure of Unconditioned Avoidance in the Rat 133
Muskó, Zs., see Dési, I., et al. 144

Naik, P. Y., see Sethy, V. H., et al. 19
Niemegeers, C. J. E., Verbruggen, F. J., Janssen, P. A. J.: The Influence of Various Neuroleptic Drugs on Noise Escape Response in Rats 249

Pakkenberg, H., see Fog, R., et al. 346
Phillips, F. J., see Hesbacher, P. T., et al. 209
Praag, H. M. van, see Korf, J. 129
— Korf, J., Woudenberg, F. van: Investigation into the Possible Influence of Chlorinated Amphetamine Derivatives on 5-Hydroxytryptamine Synthesis in Man 412

Raab, E., see Hesbacher, P. T., et al. 209
Ragland, R. E., see Clark, M. L., et al. 260
Rahhal, D. K., see Clark, M. L., et al. 260
Ramsey, H. R., see Clark, M. L., et al. 260
Randrup, A., see Fog, R., et al. 346
Rickels, K., see Hesbacher, P. T., et al. 180
— see Hesbacher, P. T., et al. 209
Roberts, D. J., see Jones, B. J., et al. 288
Rohte, O.: Observation of the Grooming Behaviour of Reserpinized White Mice as a Method for Investigating Reserpine Antagonism and Synergism . 154
Rolfe, B., see Crammer, J. L. 26

Sablosky, L., see Hesbacher, P. T., et al. 209
Sakalis, G., see Lader, M. H., et al. 118
Santos, M., see Carlini, E. A., et al. 82
Schneider, A. M., Kapp, B. S., Sherman, W. M.: The Effects of Centrally and Peripherally Acting Cholinergic Drugs on the Short-Term Performance Gradient Following Passive-Avoidance Training 77
Senault, B.: Comportement d'agressivité intraspécifique induit par l'apomorphine chez le rat 271
Serafetinides, E. A., see Clark, M. L., et al. 260
Sethy, V. H., Naik, P. Y., Sheth, U. K.: Effect of d-Amphetamine Sulphate in Combination with CNS Depressants on Spontaneous Motor Activity of Mice 19
Sherman, W. M., see Schneider, A. M., et al. 77
Sheth, U. K., see Sethy, V. H., et al. 19
Sigg, E. B., Keim, K. L.: Enhancement by Desipramine of Hypothalamically Evoked Discharges in Preganglionic Sympathetic Nerves 378
Sloan, J. W., see Martin, W. R. 231
Srimal, R. C., Dhawan, B. N.: An Analysis of Methylphenidate Induced Gnawing in Guinea Pigs 99
Stephenson, J. A., see Morrison, C. F. 133
Stone, G. C., see Jones, R. T. 108
Strömberg, U.: DOPA Effects on Motility in Mice; Potentiation by MK 485 and Dexchlorpheniramine 58

Page

SVENSSON, T. H., WALDECK, B.: On the Role of Brain Catecholamines in Motor Activity: Experiments with Inhibitors of Synthesis and of Monoamine Oxidase 357

TANSELLA, M., see LADER, M. H., et al. 118
TOLMAN, B. D., see JONES, B. J., et al. 288

VANDERVORT, W. J., see HESBACHER, P. T., et al. 180
VERBRUGGEN, F. J., see NIEMEGEERS, C. J. E., et al. 249

WALDECK, B., see SVENSSON, T. H. 357
WASER, P. G., see KÖNIG-BERSIN, P., et al. 1
WEISE, C. C., see HESBACHER, P. T., et al. 180
WHALEN, E. M., see HESBACHER, P. T., et al. 209
WOUDENBERG, F. VAN, see PRAAG, H. M. VAN, et al. 412

Indexed in Current Contents

Subject Index

Acepromazine 271
Aggression 82, 271, 320, 346
Alcohol 108
Amanita muscaria 1
Amethocaine 99
Amiperone 249
Amitriptyline 99, 154, 271, 288
Amobarbital 133
Amphetamine 99, 133, 144, 238, 314
d-Amphetamine 19, 38, 154, 271
Amylobarbitone (see Amobarbital)
Antagonism 94, 154, 271, 288
Antidepressant activity 94, 412
Anxiety 180, 209
Apomorphine 99, 271
Atropine 38, 77, 99, 271, 288
Attrition 180
Avoidance 11, 77, 133, 162, 249, 305, 333

Behavior (see also Grooming behavior) 108, 144, 271, 346, 287, 407
Benperidol 249
Bradycardial response 118
Brain lesions 346
Brain monoamines 1, 58
Brain sensitivity 320
Bulbocapnine 238

Caffeine 99, 271
Cannabis sativa (see Marijuana)
Catalepsy 238, 249, 346
Catatonia 82
Catecholamine blocking agents 99
Catecholamines 1, 357, 412
Central nervous system depressants 19
Chlordiazepoxide 19, 133, 162, 271
Chlorimipramine 124
4-Chlorinated amphetamines 412
p-Chlorophenylalanine 1, 387
Chlorpromazine 11, 19, 133, 144, 227, 238, 249, 260, 271, 333, 407
Cholinergic blocking agents 38
Cholinesterase inhibitors 238
Clopramine 154
Clofluperol 249
Clorgyline 118

Cocaine 99
Conditioning 11, 38, 77, 94, 124, 144, 162, 238, 249, 305, 333
Consolidation process 172
Control 38

Depression 129, 412
Desipramine 154, 378
Dexchlorpheniramine 58
Diazepam 133, 180, 209, 271
Dipiperon 271
DOPA 50, 58, 99
Dopamine 1, 58, 99
Dosage deviation 180
Dose related response 260
Drive 172
Droperidol 249
Drug abuse 108
Drug evaluation methods 94, 118, 133, 154, 227, 249
Drug induced psychosis 231
Drug metabolism 26, 320
Drug response 180, 209
Dyflos 238

EEG 108
Electroconvulsions 94
Ephedrine 99
Eserine 99

Fluanisone 249
Fluphenazine 249

Gayer test 82
Gnawing response 99
Grooming behavior 154

Haloperidol 249, 271
Hebb-Williams-Test 68, 172
Hexobarbital 320
Homovanillic acid 129
5-HT 1, 58, 129, 412
5-HTP 50
5-Hydroxyindoleacetic acid 1, 129, 412
5-Hydroxytryptamine (see 5-HT)
5-Hydroxytryptophan (see 5-HTP)
Hydroxyzine 271

Ibotenic acid 1
Imipramine 26, 124, 133, 154, 238, 271
Improvement differences 209
Iproniazid 154
Isolation 320

Learning 11, 68, 77, 144, 162, 172
Leo 640 (see Clopramine)
Locomotor activity (see Motor activity)
Lysergic acid diehtylamide 1, 99, 231, 387

Marijuana 82, 108
Memory 11, 38, 77
Meprobamate 19, 271
Mescaline 99
Metabolism (see Drug metabolism)
Methylphenidate 99
alpha-Methyl-*p*-tyrosine 387
MK 485 58
Model psychosis (see Drug induced psychosis)
Monoamine oxidase inhibitors (see also names of specific compounds) 118, 357
Monoamines 1, 50, 58
Moperone 249
Morphine 271
Motor activity 19, 58, 82, 94, 133, 227, 238, 288, 314, 357
Muscimol 1

Nalorphine 99
Neostygmine 77, 238
Neurosis 180, 209
Nialamide 50, 288
Nicotine 68, 133, 300, 305, 325
Noise escape test 249
Noradnamine 288
Noradrenaline 1, 58, 325
Nortriptyline 154, 288

Oestrous behavior 50
Open field technique 227

Pargyline 50
Pemoline 227
Pentobarbital 19, 133
Performance 108, 144, 300
Perphenazine 249
Phenobarbital 180, 209
Phenylephrine 118
Physostigmine 77, 238
Picrotoxin 172
Pimozide 249
Pipamperone 249
Population effects 180, 209
Potentiation (see Synergism)
Probenecid 1, 129
Procaine 99
Prothipendyle 271
Protoveratrine 99
Ptosis 94, 154, 249
Pulse rate 108
Pyrogallol 99

Reserpine 19, 50, 94, 154, 271

Schizophrenia 260
Scopolamine 38
Serotonin (see 5-HT)
Side effects 180, 209
Sidman avoidance test 249
Social deprivation (see Isolation)
Socioeconomic factors 209
Spiramide 249
Spirilene 249
Spiroperidol 249
Swimming endurance 300
Sympathetic nerves 378
Sympathomimetic amines 118
Synergism 58, 154, 288

Temperature 94
Tetrabenazine 50, 238, 288
Tetrahydrocannabinol (see Marijuana)
Thioperazine 249
Thioridazine 249, 271
Time estimation 108
Tobacco alkaloids 300, 305
Tranylcypromine 99
Tremorine 99
Trifluperazine 249
Trifluperidol 249
Triflupromazine 249
Trimipramine 154
Triperidol 271
Tryptamine 231
Tyramine 99, 118

Yohimbine 99

Instructions to Authors

1. Papers will be published in **English, French or German.**

2. Authors should submit **manuscripts together with two copies.** The original illustration material (original drawing etc.) and two copies should be submitted together with the manuscript.

3. The text should be as **clear and concise** as possible. Both form and content of the paper should be carefully checked to exclude the need for corrections in proof. A charge will be made for changes introduced after the manuscript has been set in type.

4. **Manuscripts** should be typewritten, double-spaced, on one side of letter size paper and with wide margin on the left. All pages should be numbered consecutively. Tables, footnotes and legends for illustrations should be typed (double-spaced) on separate pages. Use the metric system for text and figures.

5. The **first page** should bear:
a) the title;
b) the name(s) of the author(s);
c) the name of the laboratory where the work was carried out;
d) a running title of not more than 67 typewriter strokes;
e) footnotes to the title (marked by asterisks).

6. Each paper should be preceded by a brief **abstract** in English concerned with the methods used and with the experimental results which should be presented in such a way that it is possible for the reader to assess their significane. It should be as short as possible and should **not exceed 200 words.**
French and German articles should also have an English translation of the title.

7. Immediately following the abstract, some relevant **key words** should be supplied for subject indexing.

8. Articles dealing with **original investigations** should first state the problem concisely and arrange the material under Methods, Results, Discussion, References.

9. **Footnotes** should be kept to a minimum and numbered consecutively throughout the paper. Footnotes referring to the title or authors of the article are to be marked by asterisks.

10. The **bibliography** should include only work cited in the text. References should be listed alphabetically at the end of the paper as follows: *journal papers*—names and initials of all authors, full title, journal abbreviated in accordance with World Medical Periodicals, volume number, first and last page numbers, year in parentheses; *books*—names of authors, full title, edition, place, publisher, year. *Examples:*

Latz, A., Bain, G. T., Kornetsky, C.: Attenuated effect of chlorpromazine on conditioned avoidance as a function of rapid acquisition. Psychopharmacologia (Berl.) 14, 23—32 (1969).

Fisher, S., Cole, J. O., Rickels, K., Uhlenhuth, E. H.: Drug set interaction: The effect of expectation on drug response in outpatients. *In:* Neuropsychopharmacology. P. B. Bradley, F. Flugle and P. Hoch, *eds.*, vol. 3, pp. 149—156. Amsterdam: Elsevier 1964.

Several publications by the same author or group of authors should be listed in chronological order; those that appear in the same year should be distinguished by the suffixes a, b, c etc. Citations in the text should be given in parentheses, e.g. (Bindra and Mendelson, 1963) or (Beckman, 1958; Brown, 1963), except when the author's name is part of a sentence, e.g. "Mann (1966) reported that..." When a paper with more than two authors is cited, all authors are named the first time, but subsequently only the first author, e.g. (Miller *et al.*, 1963).

11. Figures should be separated from the text and numbered. They should be restricted to a minimum. Descriptions in captions should not be expanded in the text, nor should the same data be given in both graph and table form. Coloured or previously published illustrations are not ussually accepted. Original drawings and graphs should be drawn in Indian ink with lines of uniform thickness. It must be emphasized that a maximum area available is 108 × 177 mm ($4^1/_4 \times 7''$). Inscriptions should allow for any reduction in scale—a capital letter should be about 1.8 mm high in the final version. If figures have to be redrawn for the blockmaker, this may cause considerable delay in publication. Photographs should be sharp, well-contrasted glossy prints at right angles. Authors should mark them with Letraset (Instant Lettering).

SPRINGER-VERLAG
BERLIN · HEIDELBERG · NEW YORK

Handbuch der experimentellen Pharmakologie
Handbook of Experimental Pharmacology

Heffter-Heubner

Herausgegeben von/Editorial Board: O. Eichler, Heidelberg; A. Farah, Rensselaer, N.Y.; H. Herken, Berlin; A. D. Welch, New Brunswick, N. J.

Beirat/Advisory Board: G. Acheson, E. J. Ariëns, Z. M. Bacq, F. v. Brücke, P. Calabresi, S. Ebashi, E. G. Erdös, V. Erspamer, U. S. von Euler, W. Feldberg, R. Furchgott, A. Goldstein, G. B. Koelle, O. Krayer, H. Rasková, M. Rocha e Silva, F. Sakai, P. Waser, W. Wilbrandt

New Series

Volume XX/2

Pharmacology of Fluorides

Part 2

Editor: Frank A. Smith

With 59 figures. XVI, 451 pages. 1970. Cloth DM 146,—; US $ 40.20

This volume is a continuation of the in-depth review of the pharmacological properties of fluorides, the first part of which was presented in „Handbuch der experimentellen Pharmakologie" Vol. XX/1. Each of the seven chapters in the present volume is written by an experienced and recognized expert in his field.
It is the aim of this volume to present detailed and thorough reviews of selected areas of the biological effects of fluorides.
The areas chosen include effects at the intracellular and cellular levels as well as at the organ and system levels.
The contents of the volume are about equally divided between inorganic and organic compounds. Considerable attention has been paid to chemical structure—activity relationships, and a chapter is included dealing with the determination of fluorides as they occur in inorganic and in organic compounds. Consequently, the volume should be of interest to chemists as well as to biologically orientated research workers.

Contents: A. M. G. Macdonald: Methods of Analysis for Fluorine. — A. Wiseman: Effect of Inorganic Fluoride on Enzymes. — J. Matthews: Changes in Cell Function Due to Inorganic Fluoride. — F. S. Caruso, E. A. Maynard, V. DiStefano: Pharmacology of Sodium Fluoride. — R. E. Marquis: Fluoroamino Acids and Microorganisms. — Philip S. Chen Jr. and Poul Borrevang: Fluorine-Containing Steroids. — Frank A. Smith: Biological Properties of Selected Fluorine-Containing Organic Compounds. — Author Index. — Subject Index.

Volume XX/1

Pharmacology of Fluorides

Part 1

With 155 figures. XX, 608 pages. 1966. Cloth DM 144,—; US $ 40.00

■ **Prospectus on request**

Responsible for advertisements: Edgar Seidler, D-1000 Berlin 15, Kurfürstendamm 237
Springer-Verlag, Berlin, Heidelberg, New York
Printed in Germany by Wiesbadener Graphische Betriebe GmbH, D-6200 Wiesbaden
© by Springer-Verlag Berlin Heidelberg 1970